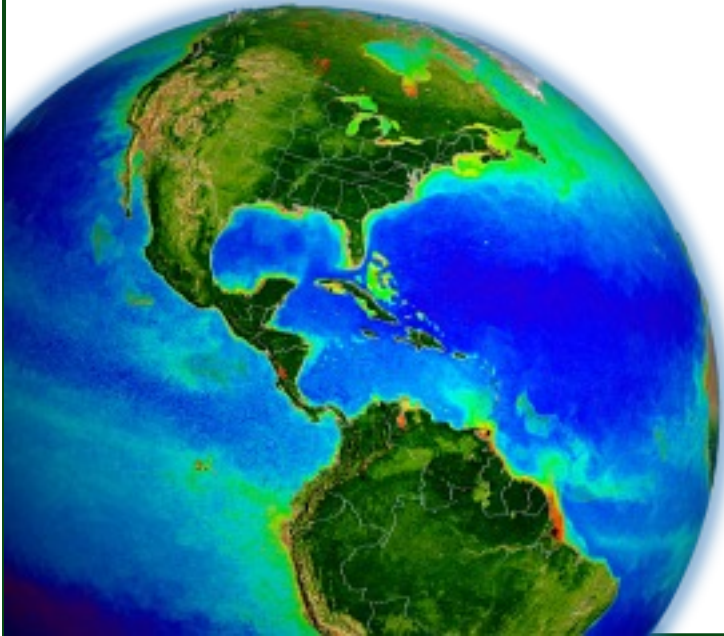# Status of the OBPG Calibration for SNPP VIIRS and NOAA-20 VIIRS

Gene Eplee, Gerhard Meister, Fred Patt, Shihyan Lee
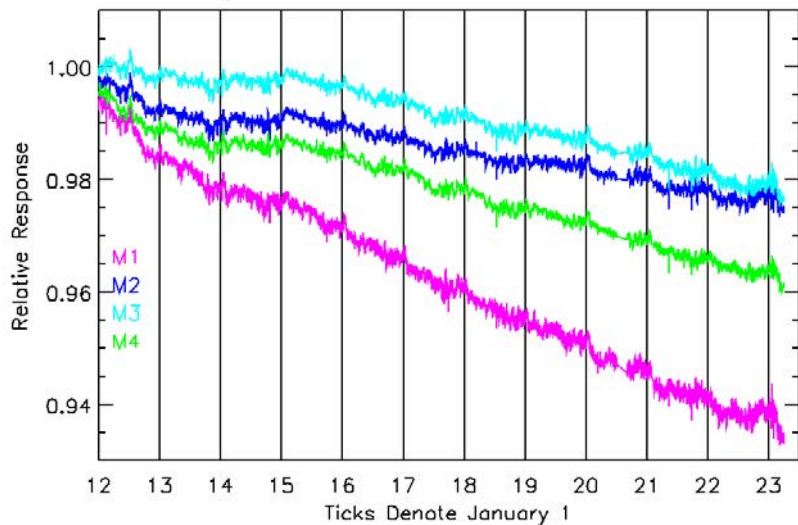
NASA Ocean Biology Processing Group
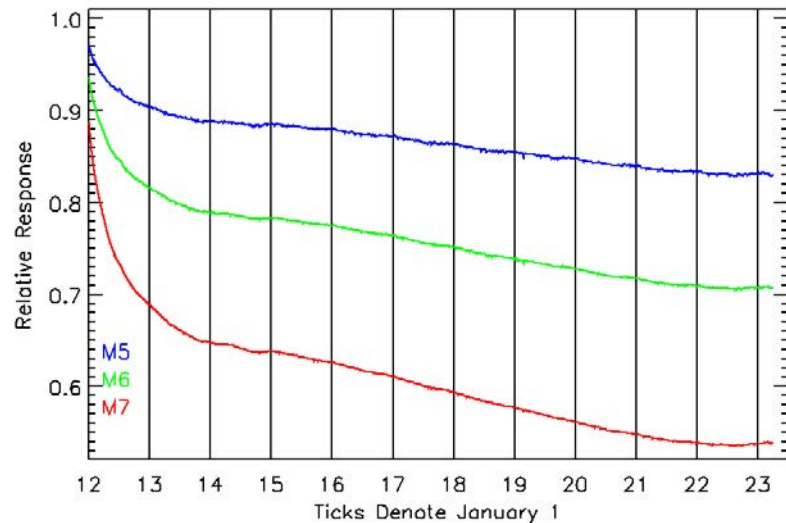
MODIS/VIIRS Calibration Workshop
May 1, 2023

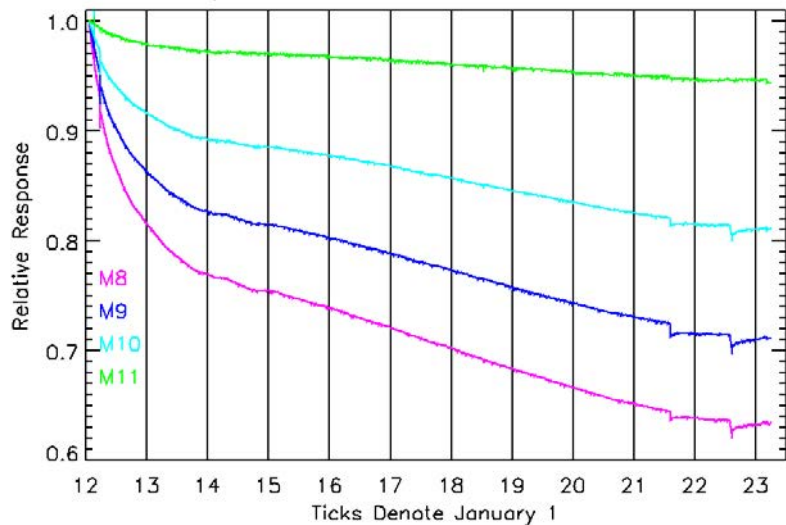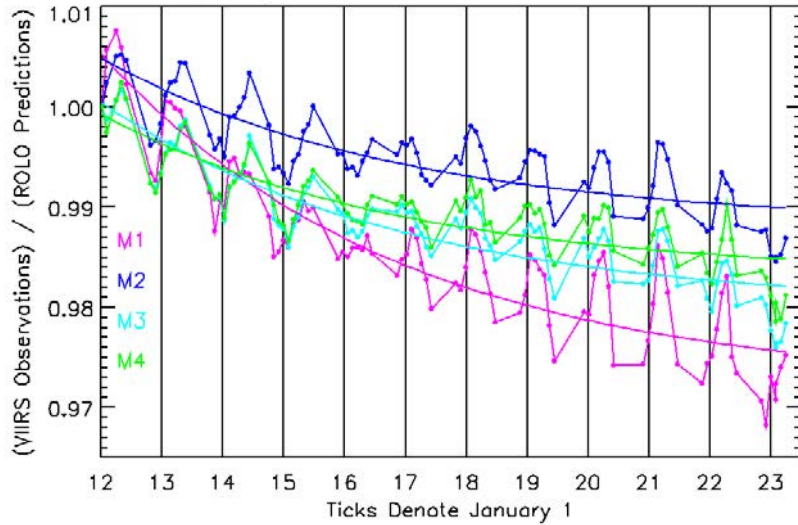# SNPP On-Orbit Calibration

SNPP Solar Time Series

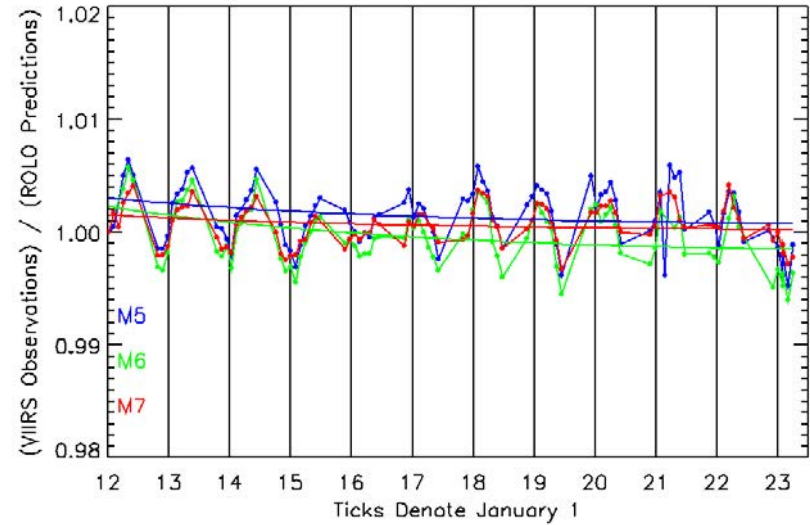The slopes of the radiometric trends change over 2014.

There is a change in the radiometric trends in 2023.
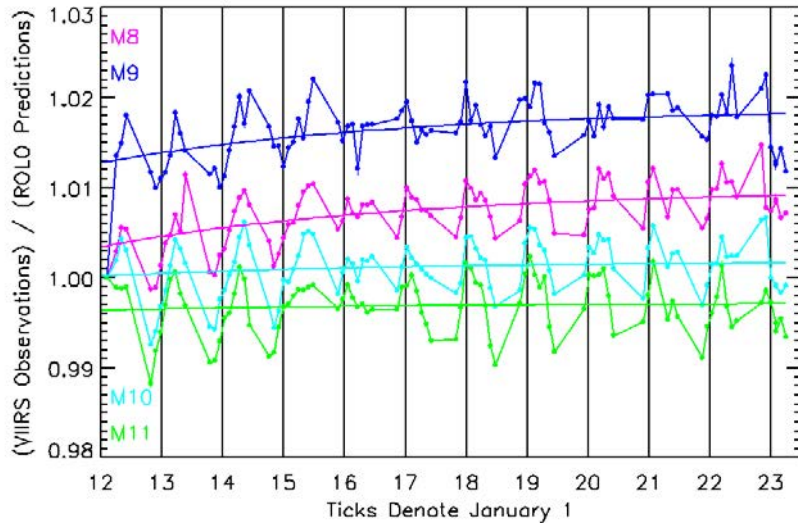
3

SNPP Lunar Time Series

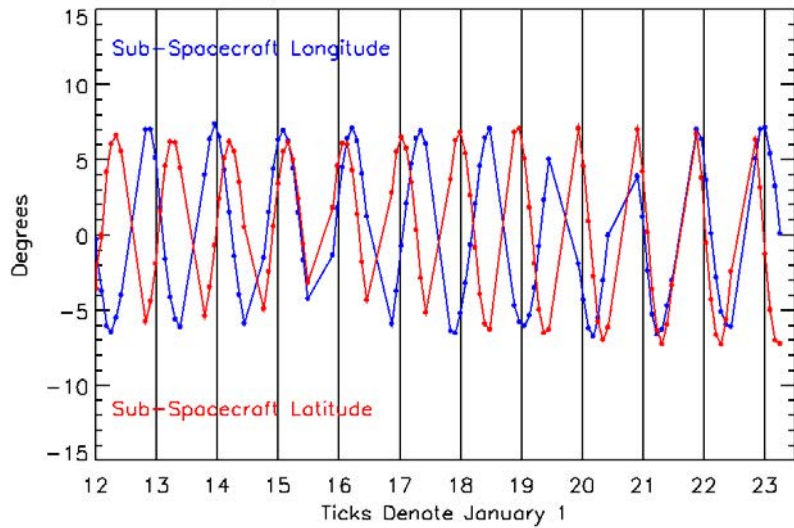SNPP VIIRS Lunar Calibration Time Series

VIIRS Lunar Calibration Time Series
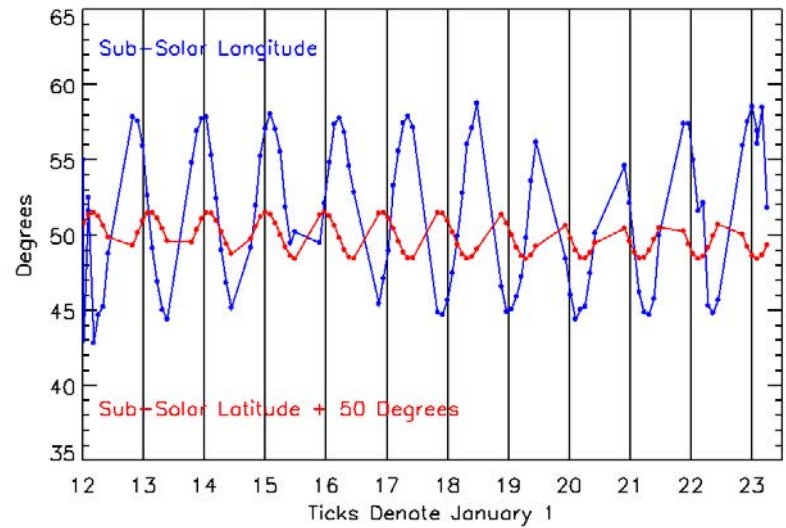

VIIRS Lunar Calibration Time Series

The lunar observations have been corrected by the solar f-factors.
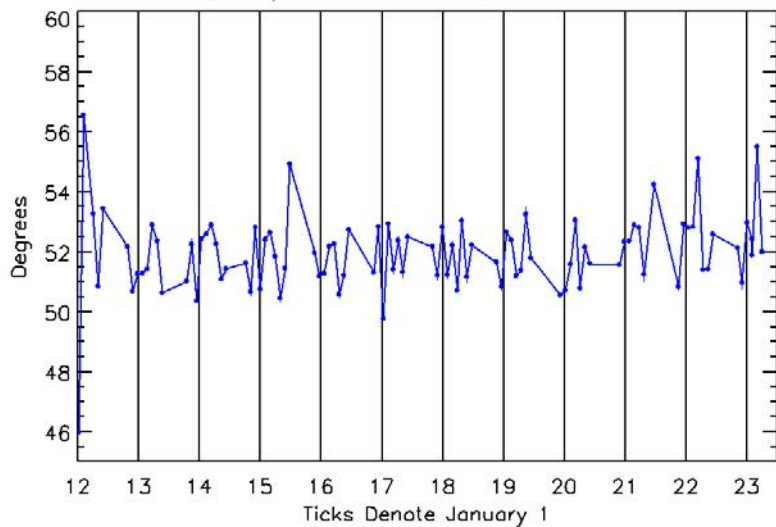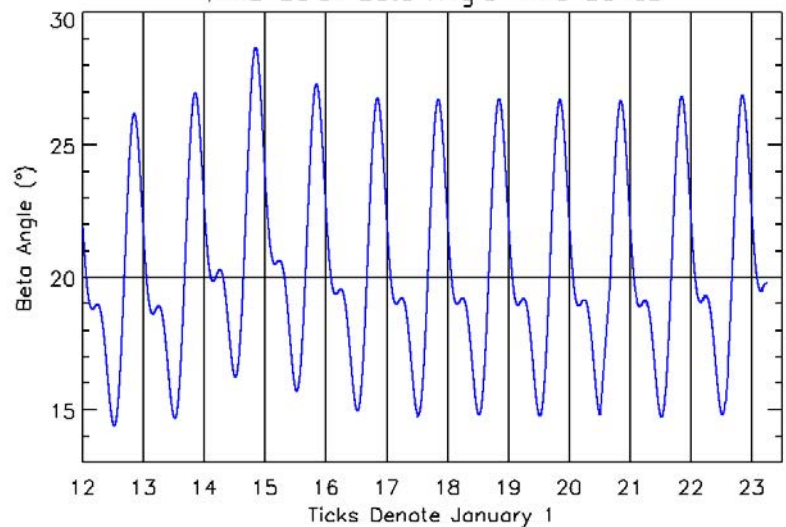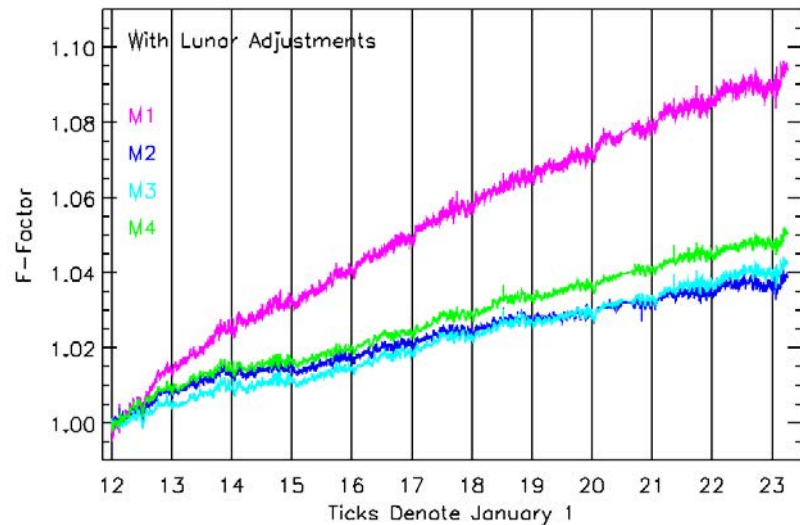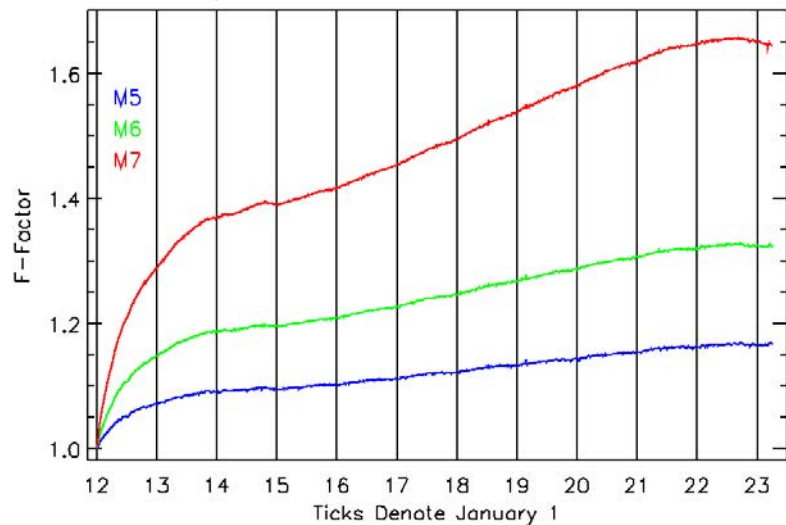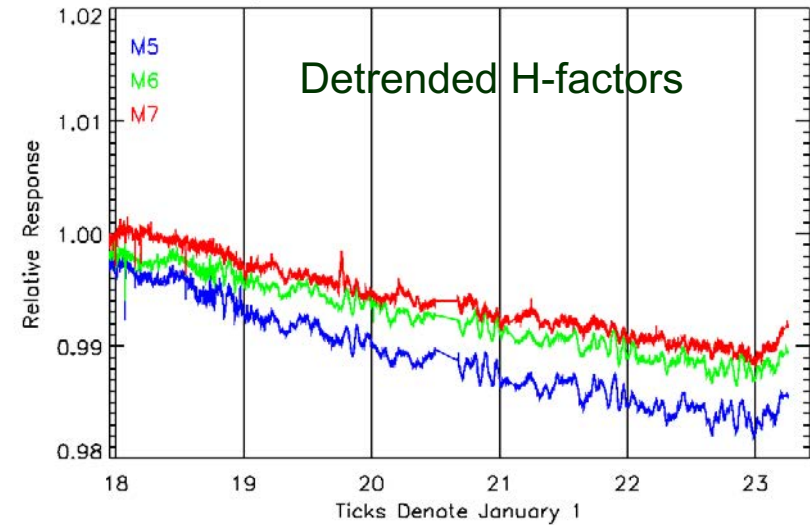
4

SNPP Lunar Time Series
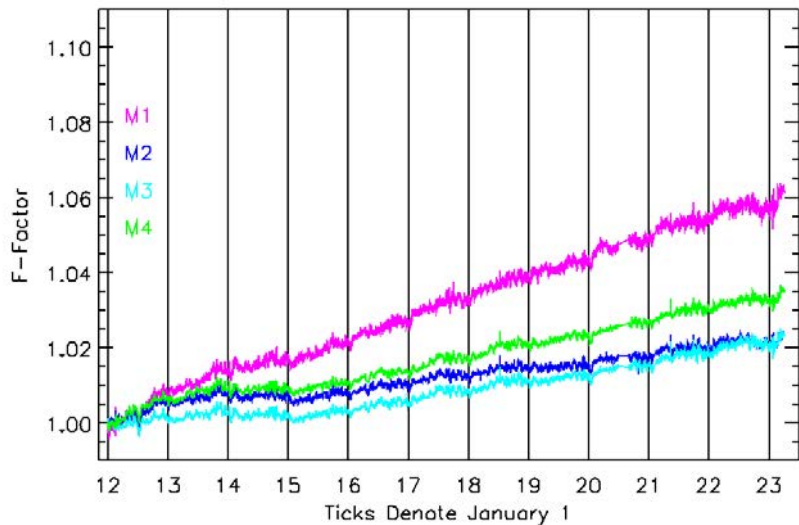
SNPP F-factors
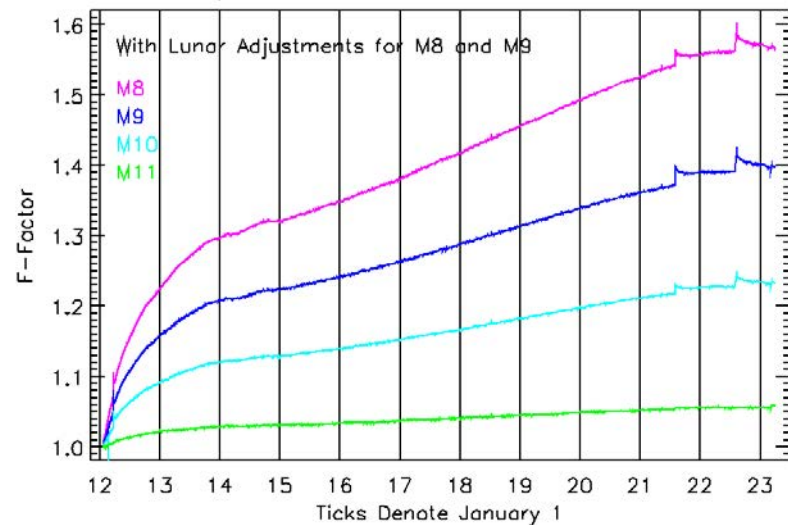
NOAA-20 On-Orbit Calibration

JPSS1 Solar Observations

JPSS1 Lunar Observations
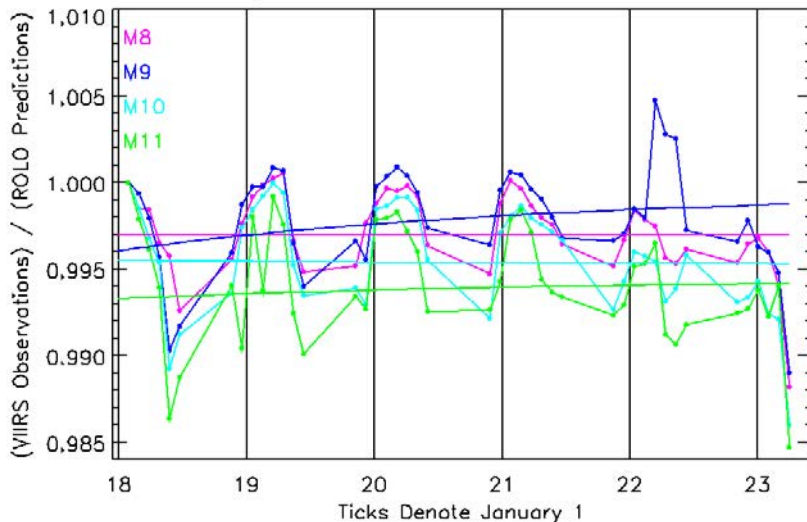
The lunar observations have not been corrected by the solar f-factors.

Lunar time series for bands M1-M4 are consistent with solar time series derived using detrended H-factors .

Lunar time series for bands M5-M7 are consistent with solar time series derived using default H-factors.
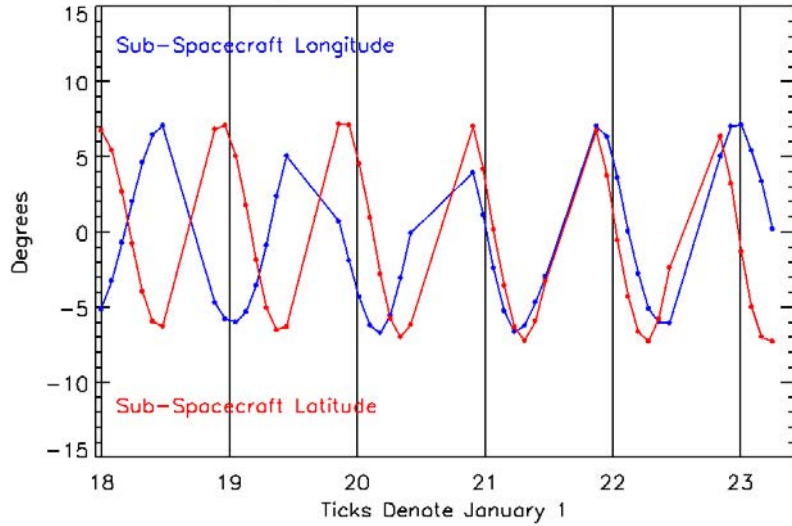
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JPSS1 Lunar Observations

SNPP and NOAA-20
Solar Calibration Anomalies
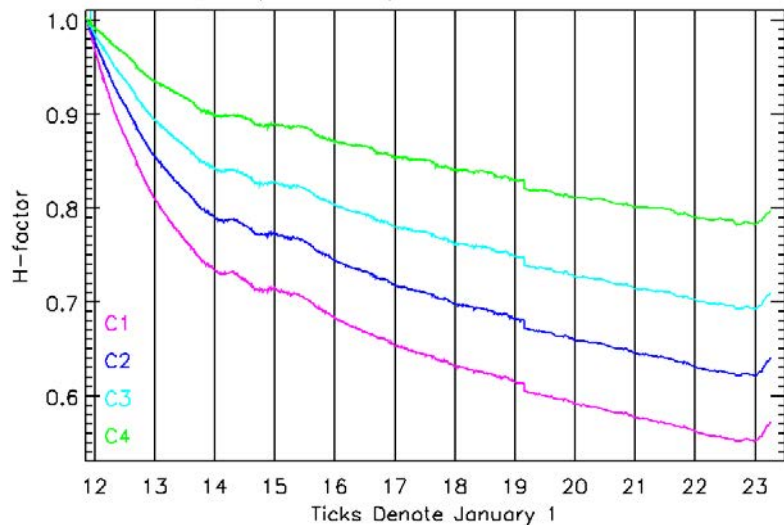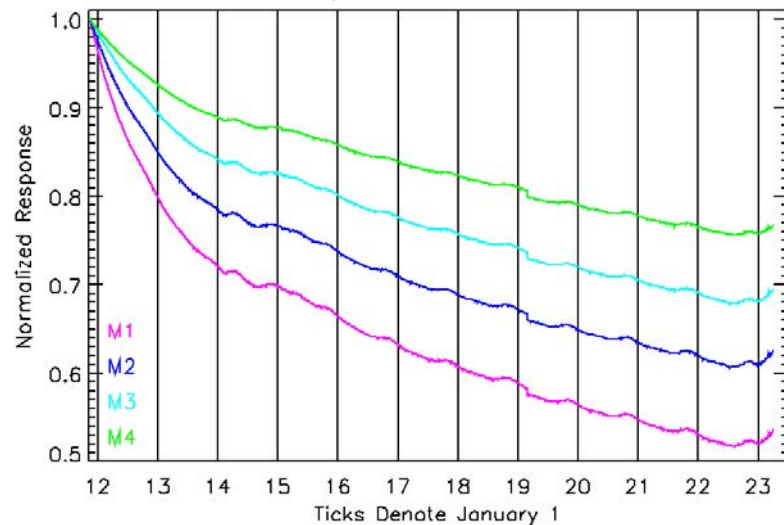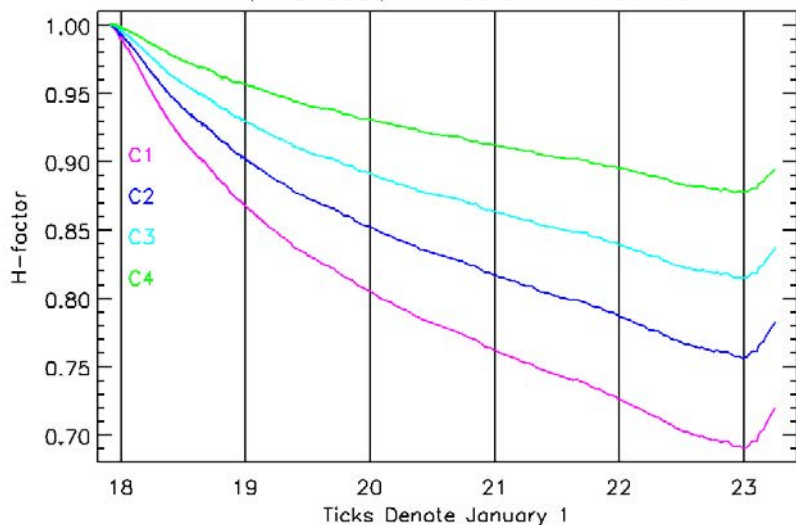
SNPP and NOAA-20 Solar Time Series
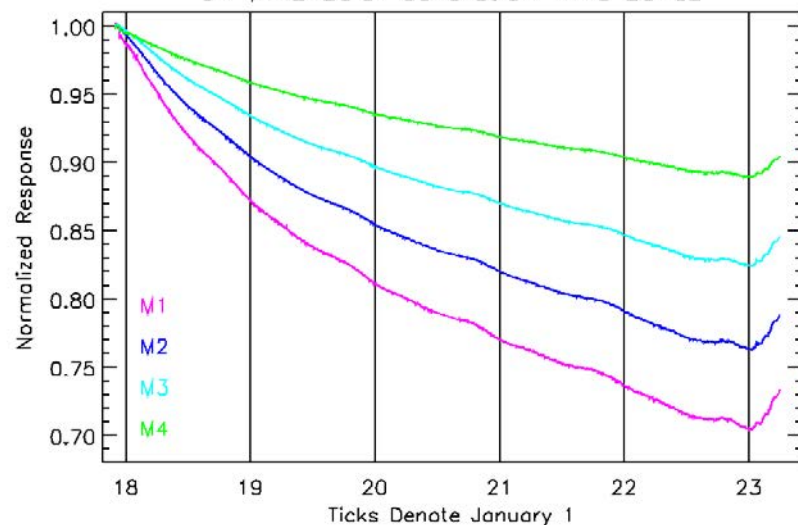
NOAA Solar Cycle Progression
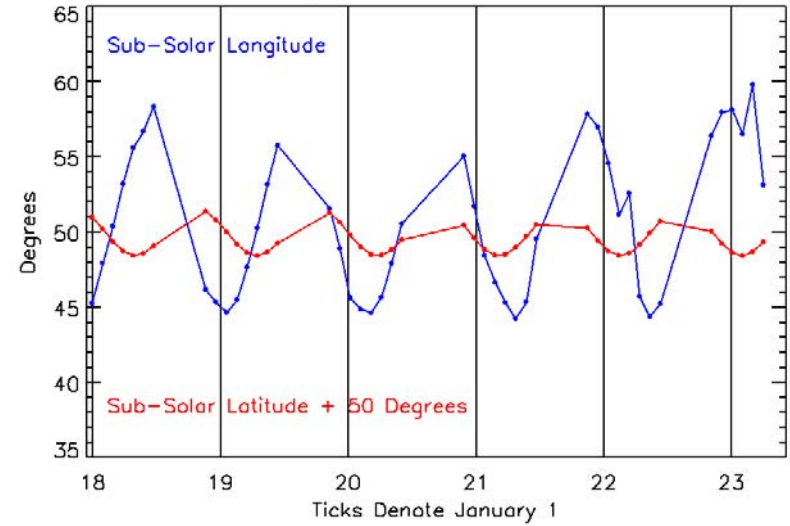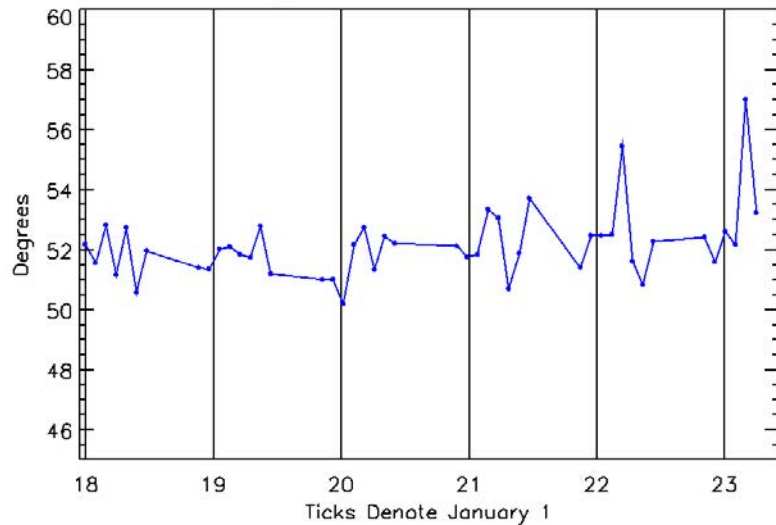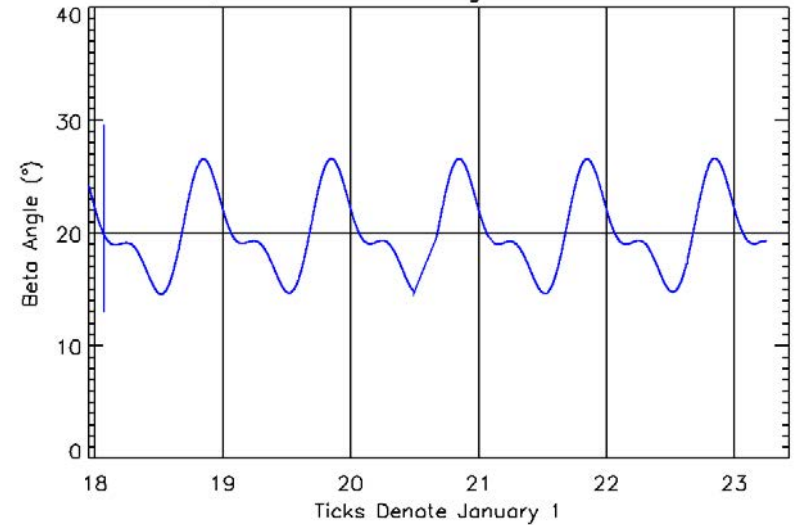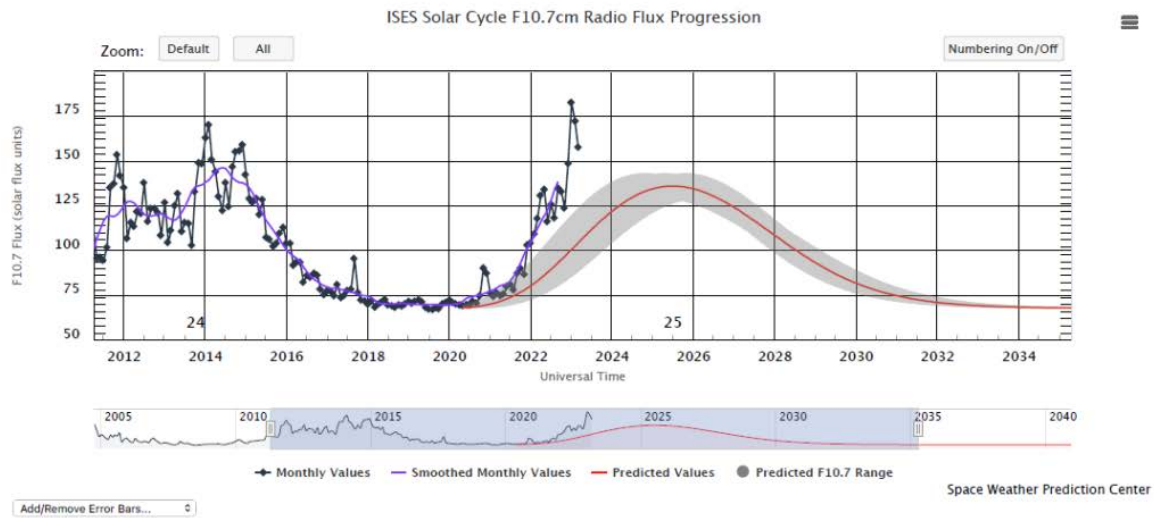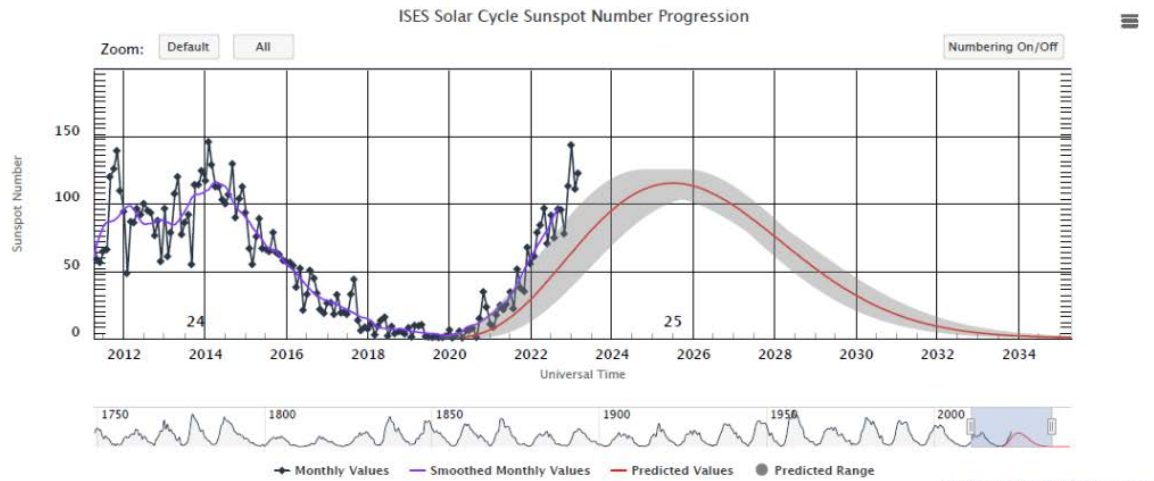
NOAA-20 Atmospheric Drag

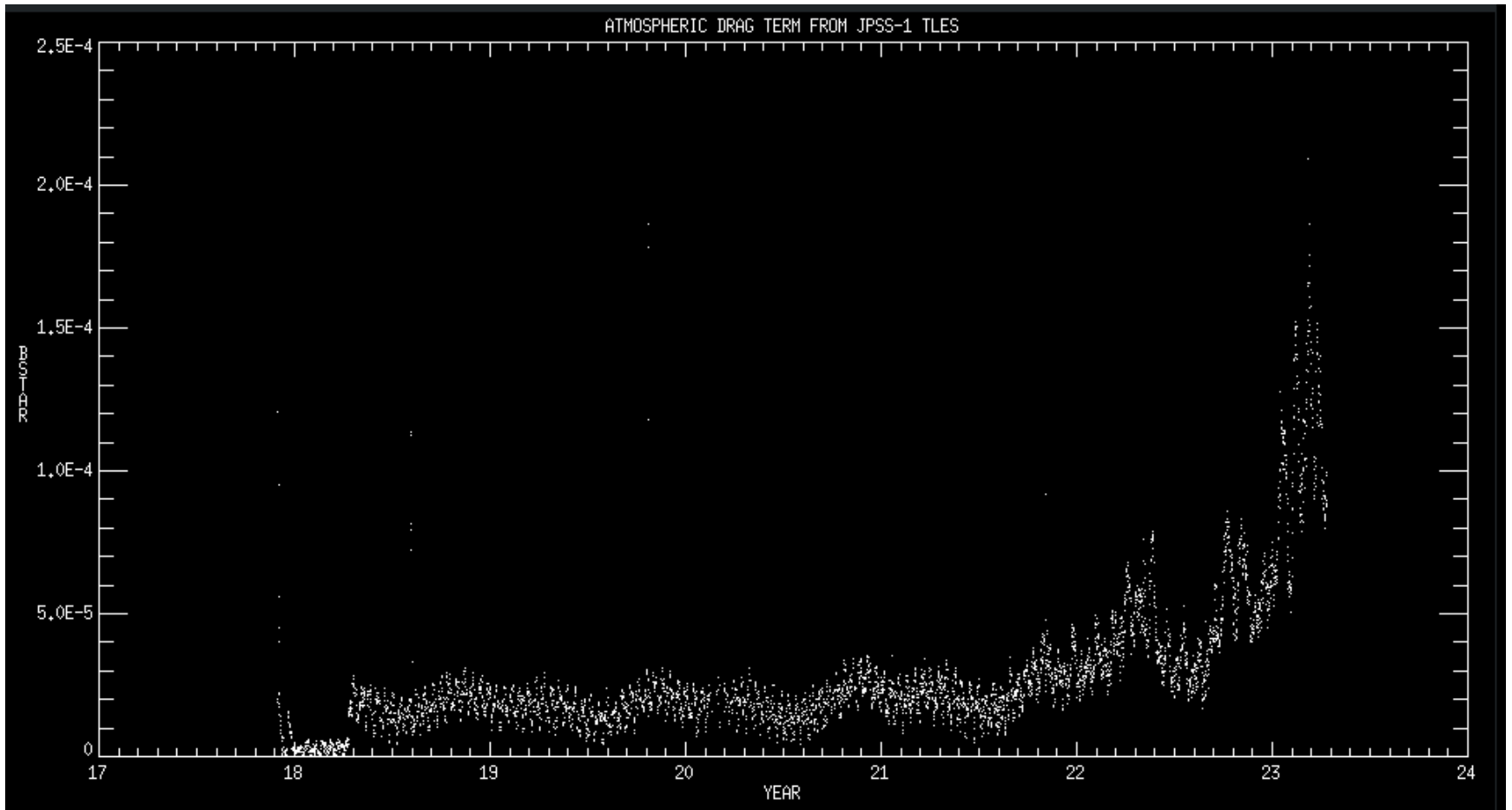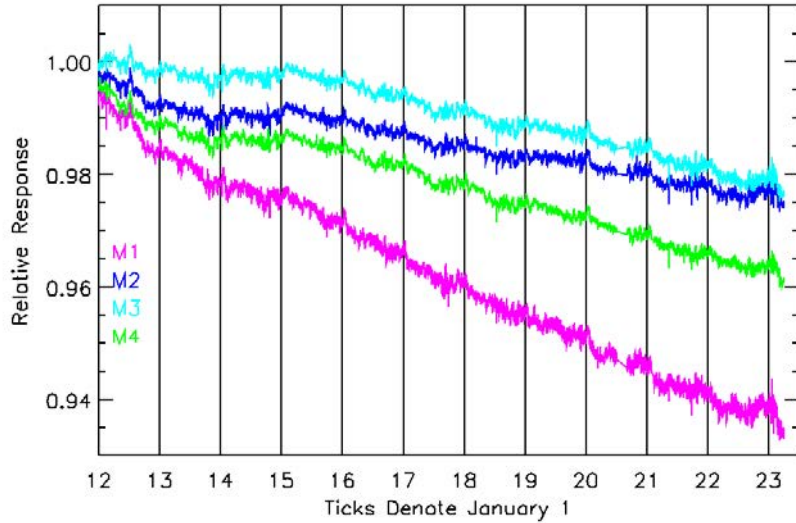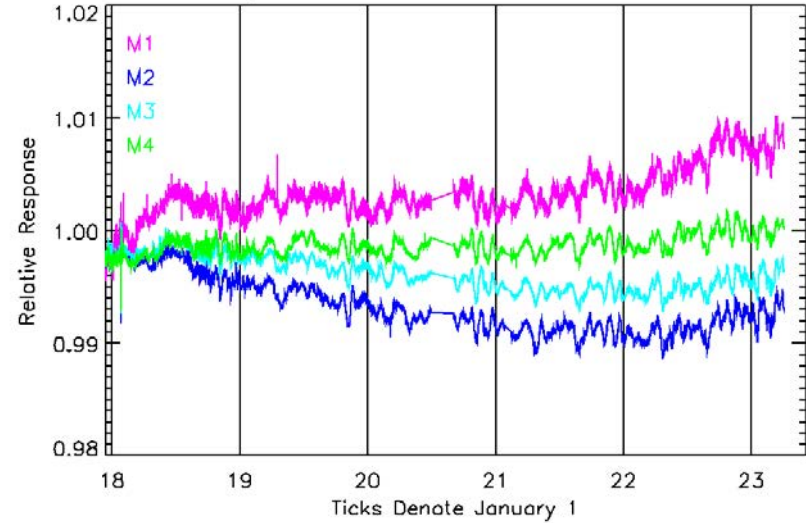# SNPP and NOAA-20 Solar Time Series
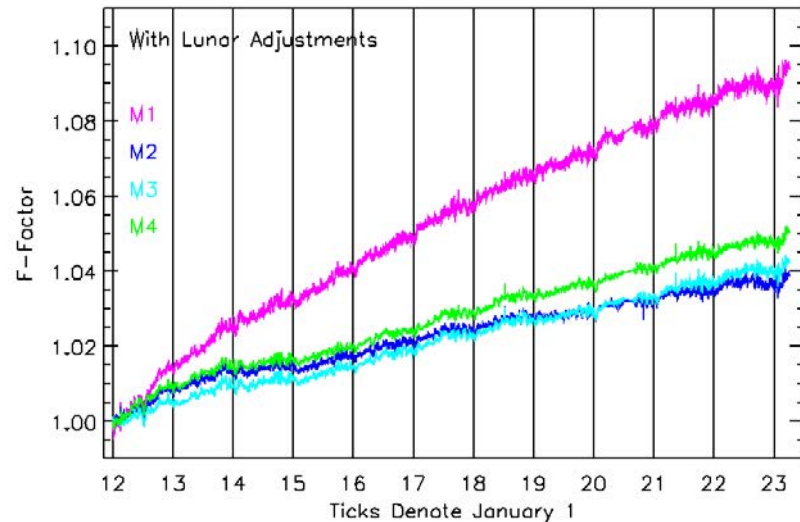
We are still using static F-factors for NOAA-20 VIIRS.

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Solar Trend Anomalies

- The solar trend anomalies are observed by both VIIRS and the SDSM on both spacecraft, so the anomalies are real.

- The 2014 anomalies for SNPP VIIRS correspond to the Solar Cycle 24 solar maximum:
  - The SDSM H-factors mitigate, but do not fully correct, the anomalies.
  - The slopes of the radiometric trends in the solar time series change from exponential to linear functions during this time.
  - The lunar adjustments mitigate the anomalies for bands M1-M4.

- The 2023 anomalies for SNPP VIIRS and NOAA-20 VIIRS correspond to the start of the Solar Cycle 25 maximum:
  - The size of the anomalies correspond to NOAA measurements of solar activity.
  - The anomalies correspond to an increase in atmospheric drag on the NOAA-20 satellite due to the solar maximum.

- The use of measured solar diffuser observations to track instrument radiometric responses has additional sources of uncertainty.

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